



The School Building as a Teaching Tool

Illinois Green Governments Coordinating Council | Sustainable Schools Symposium
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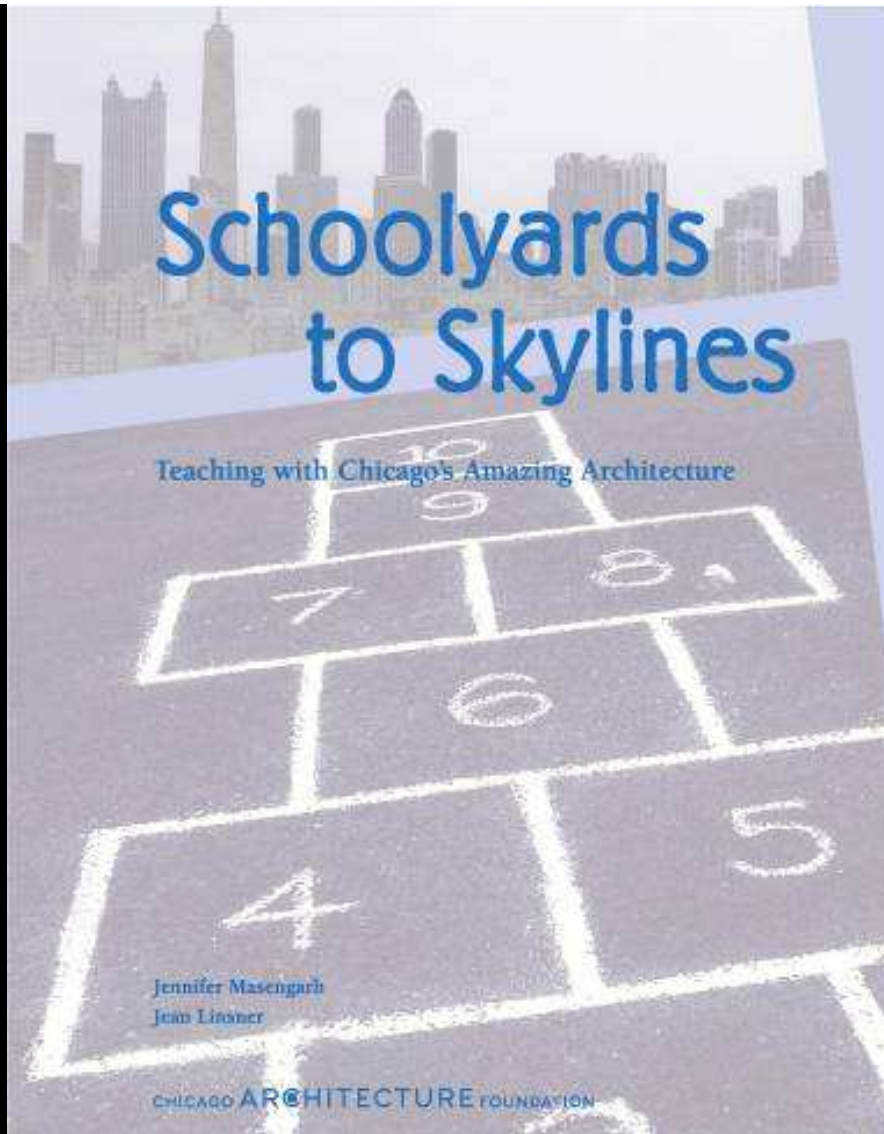
... dedicated to advancing public interest and education in architecture and related design.



224 South Michigan Avenue, Chicago
www.architecture.org



CAF's K - 12 educational resources in sustainability and green design

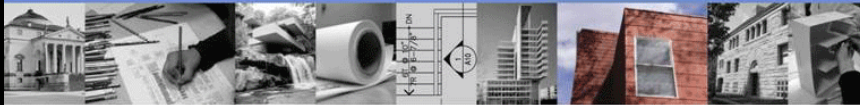


- > K- 8th grade teacher resource, 500 pages
- > Math, Science, Social Sciences, Language Arts, Fine Arts lessons
- > 2005 National AIA Honor Award
- > hands-on activities teach sustainability

Schoolyards to Skyscrapers: Teaching with Chicago's Amazing Architecture

THE ARCHITECTURE HANDBOOK:

A Student Guide to
Understanding Buildings

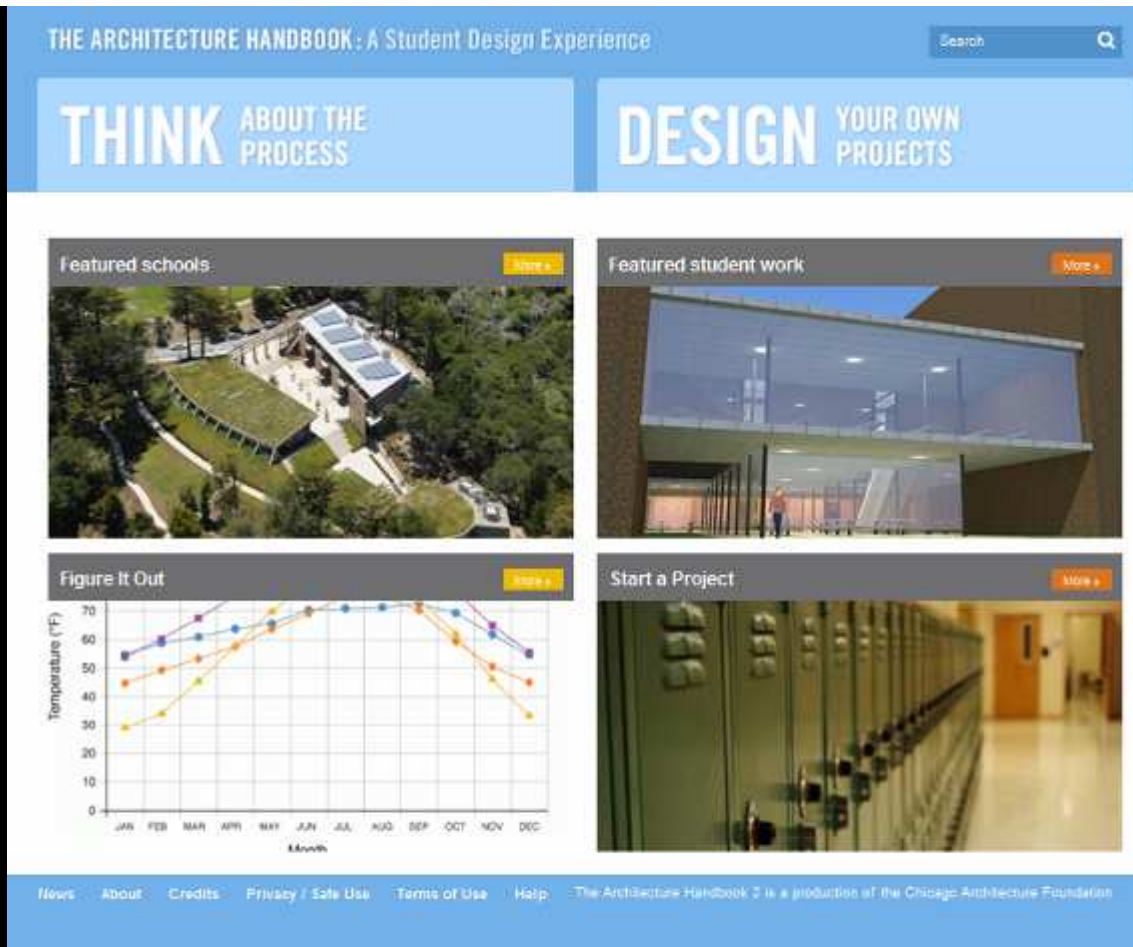


CHICAGO ARCHITECTURE FOUNDATION

Jennifer Masengarb with Krisann Rehbein

- > First high school architecture text in the nation
- > 300-page student edition and 600-page teacher edition
- > **uses green home as case study building**
- > 2009 national AIA Honor Award
- > hands-on activities teach sustainability

The Architecture Handbook: A Student Guide to Understanding Buildings



www.TAH2.org [beta]
digital, interactive curriculum for HS students
Students investigate the design
and construction of green schools



sun



land



wind



water

Space planning / Circulation

Clients / Functions of rooms

Air movement through rooms

Active vs. passive mechanical systems

Orientation and sun path

Permeable vs. impermeable ground cover

Space planning / Circulation

Math

Clients / Functions of rooms

Social Sciences, Language Arts

Air movement through rooms

Science, Geography

Active vs. passive mechanical systems

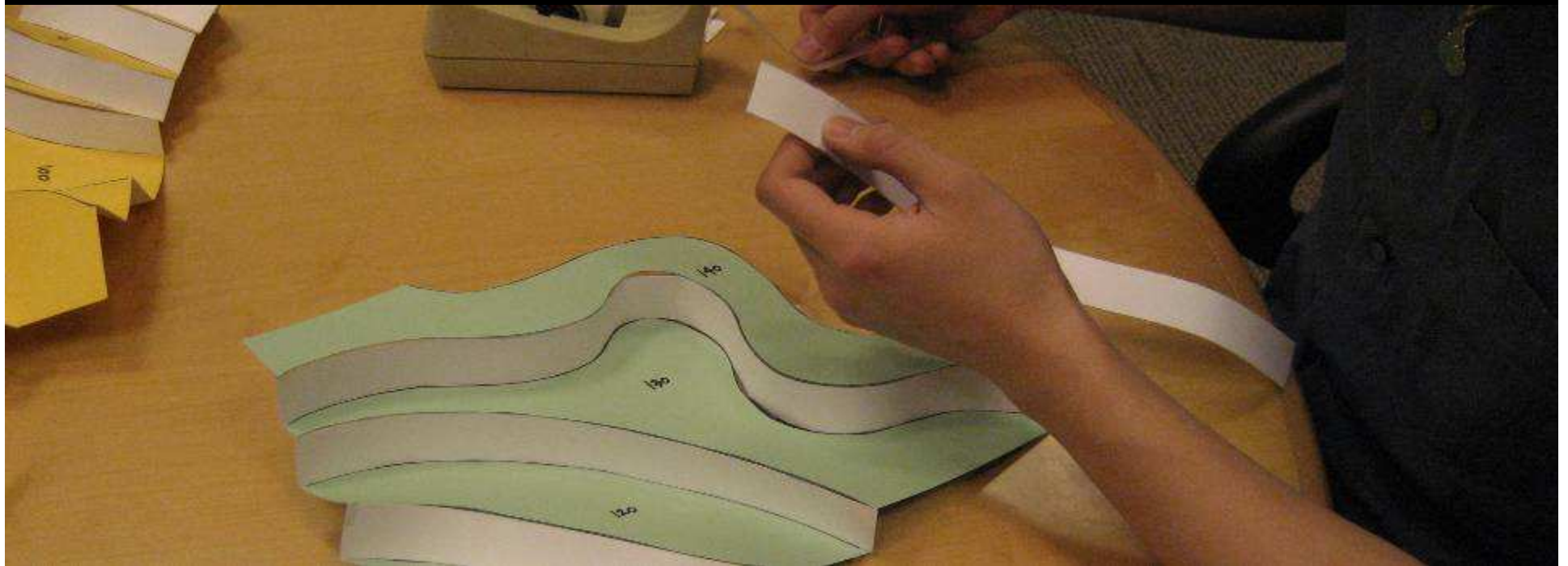
Science, Math

Orientation and sun path

Science, Geography

Permeable vs. impermeable ground cover

Science



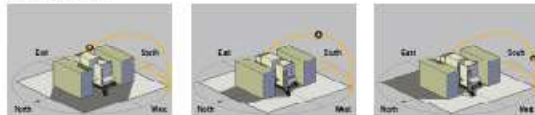


Math

Six computer models illustrate the R10 House and the path of the sun in the sky on June 21 (the first day of summer) and December 21 (the first day of winter). Use the diagrams to answer the following questions.



9:00 am June 21
R10 House - Sunpath diagrams



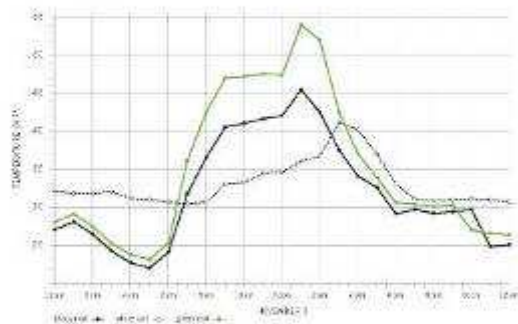
12:00 pm June 21
R10 House - Sunpath diagrams

- 1 In which direction does the sun rise?
- 2 In which direction does the sun set?
- 3 In the diagrams, when is the angle of the sun the highest in the sky over the R10 House?
- 4 When is the angle of the sun the lowest in the sky over the R10 House?
- 5 At 12:00 pm, what time of year are the shadows the shortest?

Math

The Chicago Center for Green Technology compared people's energy use and water use to calculate the carbon footprint of the R10 House. These numbers compared a house that covered 2,000 sq ft with its roof made of 40% reflective roof material and a white, black, and green roof covered in solar panels. The black and white roof material 20 square feet, while the green roof covered 40 square feet.

Every 5 minutes, the model recorded the temperature below the surface of each roof. The graph below has compared this data to show the temperature every hour within a 24-hour period in November 1.



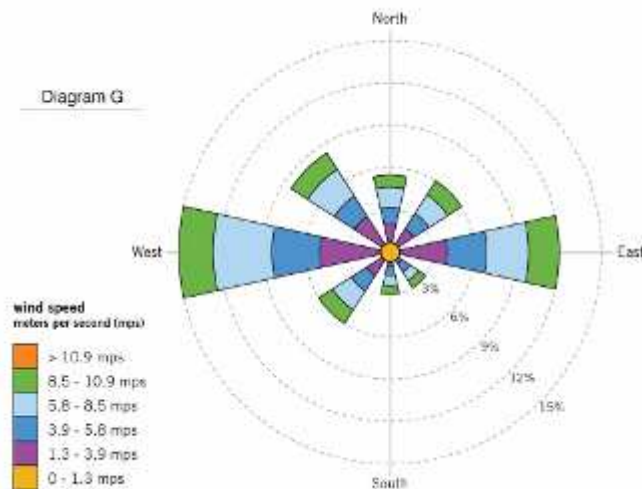
Black Roof

White Roof

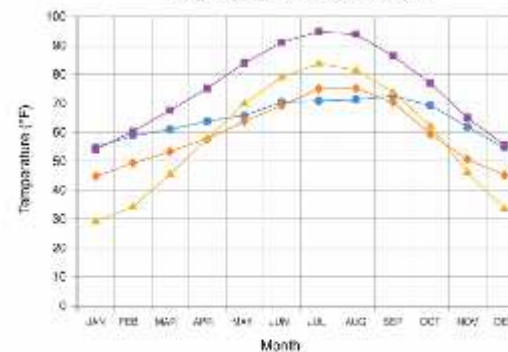
Green Roof

Temperature recorded in November 1, 2007, for the R10 House. The graph shows the temperature every hour within a 24-hour period in November 1.

Diagram G



Average Maximum Temperature (°F)



- Chicago Youth Center, Chicago, IL
- Pedro Garcia Middle School, Dallas, TX
- Newa School, Hillsborough, CA
- Benjamin Franklin Elementary School, London, UK

